

JPRS 80358

19 March 1982

East Europe Report

SCIENTIFIC AFFAIRS

No. 735

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

19 March 1982

EAST EUROPE REPORT SCIENTIFIC AFFAIRS

No. 735

CONTENTS

ALBANIA

- Successes in Biological, Chemical 'War' Against Plant Parasites
(Ibrahim Baci; ZERI I POPULLIT, 17 Dec 81) 1

CZECHOSLOVAKIA

- Advantages of Hydroelectric Power Discussed
(Frantisek Zdobina; PRAVDA, 13 Jan 82) 3

HUNGARY

- Official in Charge of New Electronics Program Interviewed
(Sandor Mihaly Interview; MUSZAKI ELET, 4 Feb 82) 4

Abstracts

- Chemistry and Chemical Engineering 9
Electronics and Electrical Engineering..... 12

POLAND

- Advances in Polish Scientific Research Noted
(RZECZPOSPOLITA, 15, 17 Jan 82) 19

New Nuclear Physics Agency
Protein Production, Consumption Research
Ultrasonic Microorganism Disintegrator

SUCSESSES IN BIOLOGICAL, CHEMICAL 'WAR' AGAINST PLANT PARASITES

Tirana ZERI I POPULLIT in Albanian 17 Dec 81 p 3

[Article by Ibrahim Baci: "For the Improvement of the Crop Protection Service"]

[Excerpts] The Station for the Protections of Crops in Durres is celebrating its 10th anniversary. During this period this scientific research institute has achieved good results. At the present time, the number one problem of this station is organizing, on more scientific bases, the activity of identifying and detecting agricultural parasites. The example of the agricultural cooperative of Kryevidh in Durres District is being generalized. In this cooperative, which has more than 4,000 hectares of land planted to various crops, damage by agricultural parasites has been reduced considerably, by properly organizing the detection and identification of the parasites and by applying high quality chemical treatments at the proper time. A close collaboration has been established between workers in the Station for the Protection of Crops and specialists in crop protection in the districts and in units in the plains areas, especially in regard to the prediction of infestations by parasites and timely action to combat the parasites.

Currently, our agriculture uses large quantities of pesticides. It is important that they be used with the greatest effectiveness, the workers at the station say. This is even more important in densely planted plains areas where the progressive technologies of cultivation of crops require the efficient use of chemicals to combat soil pests, weeds, etc. It is necessary to use the preparations sparingly (some of them are imported at great cost), in order to treat areas which are as large as possible, without polluting the environment. Workers in this institution are trying to find better methods for using herbicides on corn and cotton. They will increase their collaboration with our machine industry, so that the industry will produce the most advanced types of pumps which will economize on pesticides, reduce work and increase the quality of treatments. Also, as another means of saving pesticides and increasing the quality of treatments they are collaborating closely with the chemical industry for the production of pesticides in very small granules (from 60 to 40 microns).

Tests carried out by workers in the Station for the Protection of Crops show that the use of chemicals in combating diseases of corn stalks has been

accompanied by an increase in yields ranging from 4 to 6 quintals per hectare. In the coming years they will work to put into wide use the scientific data produced in experiments. It is necessary to establish the best manner of treating wheat seeds by combining the necessary substances.

The Station for the Protection of Crops has already had its first successes in the biological war against agricultural pests. In hothouses in the Elbasan agricultural enterprise, the insectivorous phytoseiulus persimilis was successfully used to combat the hothouse spider. The use of biological insecticide against the white mulberry tree butterfly has also produced encouraging results. This insecticide, which is being produced in the biological warfare base of Rrozhbull, has been used with high effectiveness in Fier District against the pine borer. Tests have proven the profitability of using protein slag (produced by the station) to combat the olive bug. Now the aim is to produce strains with high exzymatic power, which will pave the way for the industrial production of protein slag. The extension of the biological war, especially in cases where chemical substances cannot be used, is one of the areas of the work of the employees on this institution.

The perfection of the plant health service requires that crop protection specialists have a better knowledge of the ecology and biology of pests and diseases. The station is prepared to undertake the post-graduate specialized training of these specialists so that they, by increasing their knowledge, will give the best possible service for the intensification of agriculture.

CSO: 2102/5

ADVANTAGES OF HYDROELECTRIC POWER DISCUSSED

AU141022 Bratislava PRAVDA in Slovak 13 Jan 82 p 2

[Article by Frantisek Zdobina, PRAVDA staff journalist: "The Opportunity To Save Millions of Tons of Coal; Renaissance of Small Power Plants"]

[Summary] By more consistently utilizing hydroelectric energy to generate electricity we could save a few million tons of coal annually and use it for other purposes. As a rule, the idea of generating electricity from water resources is connected with expensive water projects. However, there also exists another possibility: reconstructing the old and even building small new hydroelectric plants.

At present, a total of 257 small hydroelectric plants are in operation in the CSSR; some years ago there were almost 15,000 of them. The small hydroelectric plants have many advantages. The cost of electricity they generate is low, the majority of the plants do not require any special attention and they are simple and can be built rapidly. Moreover, our rivers and streams have numerous dams and locks.

For this reason, the federal government has approved several measures aimed at speeding up the reconstruction and stepping up the construction of small hydroelectric plants.

It is obvious that these small power plants cannot cover the production sector's and households' demands for electricity, but their contribution to maintaining a smooth power supply definitely cannot be ignored.

At a press conference held at the Presidium of the federal government on 12 January, experts maintained that in the CSSR the capacity for 1,009 mw could be installed in small hydroelectric plants, with the possibility of generating 3,052 gwh of electric power. In Slovakia, construction of small hydroelectric plants is envisaged on the Hron River and in other localities, such as Lehota, Dobsina and Kremnica.

A total of 725 localities have been surveyed on CSSR territory in which small hydroelectric plants could operate.

CSO: 2402/34

OFFICIAL IN CHARGE OF NEW ELECTRONICS PROGRAM INTERVIEWED

Budapest MUSZAKI ELET in Hungarian No 3, 4 Feb 82 p 3

[Interview with Sandor Mihaly, government commissioner and deputy director-in-chief of the Central Physics Research Institute of the Hungarian Academy of Sciences]

[Text] At its 23 December 1981 session the Council of Ministers passed a resolution on the "Central Developmental Program for Electronic Parts and Subassemblies" or, as it is known more briefly, the Electronics Central Development Program, the EKFP. The resolution handles in a stressed way the most forward looking part of the program, one which affects society as a whole and influences the structure, economicalness and competitiveness of the economy, primarily of industry, namely, laying the foundations for domestic manufacture of microelectronic parts, and it names Mihaly Sandor, deputy director-in-chief of the Central Physics Institute (KFKI) of the MTA [Hungarian Academy of Sciences] as government commissioner to guide it. Zsuzsa Szentgyorgyi, deputy first secretary of the MATE [Measurement Technology and Automation Scientific Association] and a member of our editorial committee, talked with him about the most important questions of the EKFP, and especially the microelectronics program.

[Question] The EKFP, born after long years of gestation, has been greeted by a part of technical public opinion with joy, but there are a number who feel that it is too much of a luxury for a small country like Hungary to build up its own microelectronics parts manufacture. It is true that some large enterprises, such as IBM and Hewlett-Packard, recognized fairly early that they would be at a disadvantage without their own electronic parts manufacture, so they created their own enterprises for internal supply.

[Answer] This is true, and the trend is strengthened by the fact that in the past 2-3 years a number of semiconductor factories (for example, Zilog and Fairchild) have been bought up by large enterprise groups. This is understandable because just as the manufacture of printed circuit boards cannot be centralized--unfortunately the domestic example proved this rather spectacularly--

and most electronics factories produce their own special printed circuit boards, at most ordering from outside firms the boards needed in large numbers, so a somewhat similar situation will begin to develop in microelectronics sooner or later. Especially if we consider that all the functions put on one earlier printed circuit board practically "fit into" one very highly integrated circuit package. In the second place, by the end of the 1970's the cost distribution among the three basic part-technologies for producing microelectronic devices--design (production of masks), wafer manufacture and packaging--changed. As production improves and the number of elements or functions on one wafer increases the latter two part-technologies become specifically cheaper and the share of the first increases--at the same number of units. And the number of units can be increased at will for only a very narrow group of parts.

In 1982: A Microelectronics Enterprise

[Question] Might this mean then that we must strive primarily to produce devices requiring more intellectual work, and not to produce catalog circuits manufactured in large quantities?

[Answer] Yes. We would not be able to manufacture economically and competitively the catalog circuits (for example, memories and microprocessors). In contrast to this--but based on the manufacturing technology for these--we should aim at producing devices requiring more intellectual work, equipment satisfying special user needs or task-oriented circuits. Microelectronic design and manufacture in Hungary will not take place in a vacuum. Research and development, even experimental manufacture, have been conducted and are being conducted in a number of places. For example, they have been dealing with MOS technology and the development of technological measuring equipment at the HIKI [Signal Technology Industry Research Institute] for years and at the KFKI also there is experience in the area of designing MOS circuits and a bubble memory development here is standing before the experimental manufacture stage. At the Telecommunications Research Institute (TKI) they have developed a circuit and printed board designing-manufacturing-testing (TGE) system. Izzo [United Incandescent] has an integrated circuit assembly-packaging factory in Gyongyos which is modern by European standards and it has its own semiconductor development section. We should also mention the very promising development of GaAs based circuits under way at the Technical Physics Institute of the MTA.

[Question] Perhaps this nice, long list is a little too long for such a little country.... How will this lead to a united development and manufacturing base?

[Answer] An essential link was left out of the list--trade, which is now performed by the Elektromodul (EMO) enterprise. According to the goals of the EKFP the entire chain--from research and development through manufacture to trade and market research--must be integrated into a single unit, following the example of successful semiconductor manufacturing firms. In this spirit the Council of Ministers decided that by the beginning of this year we must establish a Microelectronics Enterprise, the chief components of which will be made up of the appropriate developmental and experimental manufacturing sections of United Incandescent and the Signal Technology Research Institute. These will be joined by the research and development units from the TKI and the KFKI which deal with circuit design, in the course of 1982-1983. Later the Gyongyos semi-

conductor factory will join the Microelectronics Enterprise also. In the first quarter of this year the new enterprise and its research and marketing units (for example, the EMO) will form a research-development-production-marketing association.

Custom-Made Circuits

[Question] On what technological base will production begin?

[Answer] For the time being there will be experimental manufacture, up to 1984. Wafer manufacturing technology will be solved by purchasing licenses and equipment obtainable on the socialist market. Equipment and domestic experience are now available for design; these should be expanded or developed further. It is well known, for example, that four of our large enterprises--the MMG [Mechanical Measuring Instruments Factory] Automatic Works, the Telephone Factory, the EMG [Electronic Measuring Instruments Factory] and the BHG [Beloianisz Signal Technology Factory]--are already using the AUTER electronics designing system. We should expand and tool up for these, including the designing system at the HIKI, and with their aid anyone from industry can design integrated circuits by 1983.

[Question] What sort of expert need must we count on after gearing up, by the 1990's?

[Answer] In contemporary electronics it is less and less possible to separate the traditional "parts manufacturer" from the "equipment manufacturer." Even those manufacturing devices must be able to design--or at least specify--the technically and economically most favorable circuits suiting their own tasks. A few years ago a trend got started in the industrially developed countries which unites the advantages of cheap, quickly accessible, mass produced catalog circuits with equipment-oriented devices better suiting the special needs of a user (but relatively more expensive and more "unique"). These so-called ULA circuits (from the English, Uncommitted Logic Array) are made so that a few basic layers (functions, function elements) on the chip are mass produced and the final layers and connections are put together according to the unique desires of the purchaser. Making use of a simile I might say that this is like a semi-finished suit made by the ready-made clothing industry but adjusted to the size of the purchaser, with "custom-made" sewing. Thus, to return to the need for experts, we might say that by the 1990's we must prepare electronics experts following a different view than that to which we are accustomed. If we make an estimate in this way then the branch will need 3,500 to 4,000 graduates.

[Question] Where will these "consumers" circuits be used first?

[Answer] There are already domestic beginnings. The most significant of them is that of the Signal Technology Cooperative which produces, as jobwork, task-oriented (or to use the widespread English expression, custom-made) circuits for equipment being made abroad. Since they already have experience the Hir-Szov [Signal Technology Cooperative] has received support to begin using ULA's with domestic resources.

[Question] Beginning experimental manufacture, especially circuit design requiring a large expenditure of intellectual work, will require significant research and development activity. What relationship does the EKFP have to the research and development programs?

[Answer] The microelectronics part of the EKFP is linked to a number of national research and development programs, or incorporates a number of them. In the latter category we have the A/4 program of the National Medium-Range Research and Development Plan (OKKFT) which is a complex program for the development of microelectronics parts manufacture and has four sub-programs for design, adaptation and introduction of manufacturing technologies and covers other longer range research and development work. The program is closely linked to the K/7 program of the National Long-Range Scientific Research Plan (OTTKT) and to the A/6 program of the OKKFT. The latter deals with the chief developmental questions of domestic use of computer technology and, within this framework, with industrial introduction and further development of electronic TGE [designing-manufacturing-testing] systems. In addition, these programs are being carried out with the cooperation of a number of ministries or chief authorities (the MTA, the National Technical Development Committee, the Ministry of Industry, the Central Statistics Office).

[Question] How are our developmental programs linked to international cooperation?

[Answer] The EKFP is based to a large extent on utilization of intellectual products and information which can be obtained via international cooperation. The program is open in that we will systematically build in new achievements of technical development and information which can be obtained in international cooperation. I would like to point out especially that we expect significant results from that cooperation which was the subject of an agreement signed in July of last year by the premiers of the CEMA countries in regard to joint development of electronic parts, technologies and technological equipment.

The Possibilities of the MTESZ [Federation of Technical and Scientific Associations]

[Question] It is perhaps not well enough known that the social forums of experts were the first to call attention to the problems and tasks of domestic electronics technology development and especially parts supply. More than 7 years ago the Signal Technology Scientific Association--in cooperation with other associations interested in the theme, the Hungarian Electrotechnology Association, the Measurement Technology and Automation Scientific Association and the Janos Neumann Computer Sciences Society--took the initiative in pointing to the need for a solution at the national level of this problem which profoundly influences our entire economic development. So let me ask your opinion: How can the MTESZ and its association aid or cooperate in the successful realization of the electronics program?

[Answer] We know very well that one of the five central programs being stressed by the MTESZ deals with electronics. The support of the social forums of experts--we might say of technical public opinion--has meant great aid already in

the preparatory work. It is extraordinarily important that there also be that change in view required by the new technology; otherwise the new types of tools could hardly be used. We are counting on the effective cooperation of the associations in getting this new view adopted in education, in further training and especially in industry. It is very important that professional public opinion be regularly informed of technical changes and developments taking place in the electronics industry and that we receive appropriate feedback.

[Question] I thank you for the interview and I feel that what you have said also counts as a significant step in orienting professional public opinion.

8984

CSO: 2502/53

STUDY OF TRANSPORT PROCESSES IN MEMBRANE SYSTEMS BY THE RADIOACTIVE INDICATION METHOD. PART II. STUDY OF THE ION-TRANSPORT PROCESSES TAKING PLACE IN ION-EXCHANGE MEMBRANES, PHOTOGRAPHIC MATERIALS, AND PLANTS BY THE RADIOGRAPHIC METHOD

Budapest MAGYAR KEMIAI FOLYOIRAT in Hungarian Vol 87, No 10, 1982 pp 441-450

VARRO, TIBOR, and MADI, ISTVAN, Isotope Laboratory, Kossuth Lajos University of Sciences, Debrecen, and SOMOGYI, GYORGY, Nuclear Research Institute, MTA [Hungarian Academy of Sciences], Debrecen

[Abstract] The ion-transport processes taking place in various Hungarian- and foreign-made membranes (based on polystyrene sulfonic acid), FORTE and other photographic papers, and plants (carrots and potatoes) were examined by a radiographic method involving the use of polycarbonate, cellulose nitrate, and polyallyl diglycol carbonate solid-state trace detectors for alpha-radiography, irradiation with 14 MeV neutrons, and determining the fission products of the $U(n,f)$ nuclear reaction by preparing the fissionograms (the boron-containing samples were irradiated at a thermal neutron flux of $2 \cdot 10^{11}$ neutrons/cm² and preparation of the radiograms of the alpha particles formed in the $^{10}B(n,\alpha)^7Li$ nuclear reaction. The primary purpose of the study was to evaluate the suitability of the method described. The findings indicated that the diffusion and flow processes could be clearly distinguished and that the diffusion coefficients could be determined at a standard deviation of 20-30 percent. The findings were presented in tables, diagrams, and radiographs. Figures 9, tables 12, references 11: 1 Hungarian, 1 German, and 9 Western.

2542

CSO: 2502/46

STUDY OF TRANSPORT PROCESSES IN MEMBRANE SYSTEMS BY THE RADIOACTIVE INDICATION METHOD. PART I. STUDY OF THE ION-TRANSPORT PROCESSES TAKING PLACE IN ION-EXCHANGE MEMBRANES, PHOTOGRAPHIC MATERIALS, PLANTS, AND SOILS BY THE RADIATION-ABSORPTION TECHNIQUE

Budapest MAGYAR KEMIAI FOLYOIRAT in Hungarian Vol 87 No 10 Oct 81
pp 441-450 manuscript received 8 Aug 80

VARRO, TIBOR, and MADI, ISTVAN, Isotope Laboratory, Kossuth Lajos University of Sciences, Debrecen, and SOMOGYI, GYORGY, Nuclear Research Institute, MTA [Hungarian Academy of Sciences], Debrecen

[Abstract] The ion-transport processes taking place in ion-exchange resins (Amberlite IRC-50, made by Rohm and Haas Co., and K1 membrane, Hungarian-made), soils (clayey, sandy, and saline, from various areas of Hungary), plants (leaves, shells, roots, and seeds), and soil ingredients (H and Na montmorillonite, and H, Na, and Ca bentonite) were examined by a method based on the paper of Kryukov et al (Dokl. Akad. Nauk SSSR Vol 90, 1953, p. 379), using a variety of radioactive isotopes, including ^3H and ^{14}H which provide soft beta radiation. The primary purpose of the study was to evaluate the suitability of the method described. The findings indicated that the diffusion coefficients could be determined at an error of 20-30 percent in the range of 10^{-9} to 10^{-18} m²/sec range. The diffusion coefficients measured for numerous ions in the materials studied were presented in tables and diagrams. Figures 7, tables 19, references 13: 4 Hungarian, 3 German, 1 Russian, and 5 Western.

2542

CSO: 2502

EFFECT OF THE CLASS RANGE ON THE RELATIVE ERROR OF THE MEAN VALUE AND SCATTER OF THE PARTICLE-SIZE DISTRIBUTION OF POWDERED PESTICIDES

Budapest MAGYAR KEMIAI FOLYOIRAT in Hungarian Vol 87 No 11 Nov 81
pp 510-514 manuscript received 3 Oct 80

CSERHATI, TIBOR, Pesticide Research Institute, Budapest; and PETRO, EDE, Pesticide and Agricultural Chemistry Center, MEM [Ministry of Agriculture and Food], Budapest

[Abstract] Studies were carried out to establish the effect of the class range (1, 2, and 5 μ , most frequently used class ranges) on the relative error of the mean and scatter, and to find out whether there is any relationship between the relative error on the one hand, and the particle-size distribution and the specific class range. The tests were made on the pesticides "metilazinfosz" (0,0-dimethyl-S-(4-oxo-1,2,3-benzo-triazinyl-3-methyl)-dithiophosphate), "dinoseb-acetat" (2-(methyl-propyl)-4,6-dinitro-phenyl-acetate), "linuron" (N-(3,4-dichloro-phenyl)-N'-methoxy-N"-methyl-urea), and "tetraszul" (2,4,4,5-tetrachloro-diphenyl sulfide). The systematic errors measured were not affected by the number of samples tested if the number was above 500; the error of the scatter increased logarithmically with increasing scatter; the error of the mean value was significantly affected by the scatter; and the relative error of the scatter was relatively unaffected by the mean value. A trivariant function was presented to illustrate the relationships involved. The findings contribute to the optimization of the powder characteristics for successful application of the pesticides. Tables 6, references 5: 1 Hungarian and 4 Western.

2542

CSO: 2502/47

NEW TYPES OF TERMINAL AND CONTACT SYSTEMS

Budapest FINOMMECHANIKA MIKROTECHNIKA in Hungarian Vol 20 No 12 Dec 81
pp 361-371

SZALAY, MIKOLS, Dr, scientific consultant, Central Physics Research Institute, Budapest

[Abstract] The author describes some new terminal and contact systems for electrical installations and equipment, primarily of Western origin. The following are discussed: (1) Split-barrel terminations, available in the form of inverted "U" shape, cylindrical shape, and "U" shape. Most of these terminations are manufactured by AMP Incorporated. They are highly vibration-resistant and durable, and are superior to piercing terminations. (2) Scotchflex experimental card contacts, manufactured by 3M Electronic Products Division. The use of these contacts saves about half of the manual labor compared to earlier approaches. (3) Integrated circuit sockets and contact sleeves, available from various sources, such as Robinson-Nugent, Fischer Electronic, AMP, and Cambion. (4) "Magmate" contact and joining system for thin wire coils, manufactured by AMP Incorporated. This system employs piercing, and has many advantages over earlier approaches. The purpose of the article is to draw these new developments to the attention of Hungarian designers since they could be useful for their tasks. Figures 20, tables 6, references 8: 5 Hungarian and 3 Western.

2542

CSO: 2502/45

UDC: 62.001.23-52:681.3

AUTOMATED ENGINEERING DESIGN SYSTEMS (AMT)

Budapest MERES ES AUTOMATIKA in Hungarian Vol 29 No 12, 1981, pp 441-447
manuscript received 1981

SOMLO, JANOS, Dr, and SZENTAI, ENDRE, Dr, Computer Technology and Automation Research Institute, MTA [Hungarian Academy of Sciences], Budapest

[Abstract] The authors review the status and trends of automated engineering design systems with special emphasis on Hungarian and socialist activities and cooperative efforts. The following subjects are covered: Machine designing in cooperation with Soviet institutions, design procedures for the building industry based on Siemens computers, electronic equipment designing systems developed primarily in Hungary, control system designing based on modifications of Western developments, and equipment used in automated designing, where Hungary is still behind some other socialist countries. Among the outstanding Hungarian developments, the article discusses in some detail the AUTER-MPC system, which was developed by cooperation among Hungarian research institutions and industrial enterprises. This system has been used with success in numerous design tasks for electronic equipment. Some recent Western developments in the subject area are briefly discussed. Figure 1, references 10: 1 Western and 9 Hungarian.

2542

CSO: 2502/42

UDC: 65.012.2:681.3.049.77

PRIMARY CONSIDERATIONS IN THE DEVELOPMENT OF THE MICAD MICROELECTRONICS-BASED COMPUTER DESIGNING SYSTEM

Budapest MERES ES AUTOMATIKA in Hungarian Vol 29 No 12, 1981 pp 448-450
manuscript received 14 Sep 81

JAVOR, ANDRAS, Dr, Central Physics Research Institute, Budapest

[Abstract] The MICAD (Microelectronics Intelligent Computer Aided Design) system was developed at the Central Physics Research Institute with the following goals in mind: To provide maximum assistance to designers of integrated circuits by problem-oriented and convenient man-computer communications. To provide hierarchic systems for the layout cells by means of highly integrated (LSI/VLSI) devices. To provide maximum possible interactivity (the subsystem concerned features GD'71 and TPA70 hardware). To provide simulation close to reality. To provide maximum practicable reliability for the control of the mask-making devices. To provide fast throughput for the system-oriented circuits (this necessitated the development of effective automated connection-designing subroutines, beyond the potentialities of the cell library). In developing the system, two basic goals were kept in mind: 1. Development of basic cells and using these to assemble cells of greater complexity of hierarchic character, so that the latter cells can be used in various areas. 2. Development of highly complex circuits with the aid of the basic cells. MICAD systems already operate satisfactorily in Hungary and abroad. References 10: 6 Hungarian and 4 Western.

2542

CSO: 2502/42

UDC: 621.3.049.77.001.23:681.3.06-52

AUTOMATIC CONNECTION-DESIGNING PROGRAM FOR INTEGRATED CIRCUITS

Budapest MERES ES AUTOMATIKA in Hungarian Vol 29 No 12, 1981 pp 451-454
manuscript received 14 Sep 81

BORSOS, ISTVAN, and TEBY, ATTILA, Central Physics Research Laboratory,
Budapest

[Abstract] An algorithm was developed for automated designing of the connections in integrated circuits. It provides a 100 percent completed design, so that no time-consuming and difficult positioning of missing connections is required. This is achieved by utilizing the free area-exploitation principle, which minimizes the wiring area rather than the conductor length. The algorithm is fast, so that a pattern is completed within a few minutes, enabling the designer to try various versions within a short period of time. Relatively little capacity is required, so that the algorithm can be used when based on small computers such as the TPA 11/40. The program based on the algorithm is part of the MICAD (Microelectronics Intelligent Computer Aided Design) system, and operates as part of same. The program then designs the connection layout of the circuit simulated by the LOBSTER program, and then the DOLPHIN program prepares the corresponding mask drawings or the pattern-generator control tapes. The following input data are required: cell type, connection start and end, supply wires, cells per column, sequence of cells in the column, cell separation in the column, and external connections. The program is scheduled for implantation in the 64 kbyte memory of the TPA 11/40. Figures 2, references 12: 2 Hungarian and 10 Western

2542

CSO: 2502/42

UDC: 519.876.5:681.3.06:537.3

NEW SERVICES OF THE TRANZ-TRAN CIRCUIT-SIMULATION PROGRAM

Budapest MERES ES AUTOMATIKA in Hungarian Vol 29 No 12, 1981, pp 465-468
manuscript received 14 Sep 81

SZEKELY, VLADIMIR, Dr; TARNAY, KALMAN, Dr; and RENCZ (Mrs. KERECSEN),
MARTA, Department of Electronic Components, BME [Budapest Technical University]

[Abstract] A new version of the TRANZ-TRAN simulation program (designated TKTR81A) was incorporated recently in the MICAD (Microelectronics Intelligent Computer Aided Design) system. The modifications are the following: The capacity of the program was increased to a maximum of 100 nodal points and a maximum of 500 branches (to permit the handling of circuits containing more than 15-20 MOS transistors, specifically up to 70 MOS transistors or approximately 160 bipolar devices). Additional model versions (ENHANCEMENT, DEPLETION, EXTERNAL) can now be called up (to reduce the dependence of the threshold potential on substrate potential, and to permit consideration of the effects of channel shortening). The transistor's heat-generation and warming-up characteristics can now be included in the computations. A new bilinear current generator was incorporated (to facilitate the solution of additional problems). With the aid of the graphic postprocessor and the LOBSTER parameter identifier, the new version of the program is more versatile, faster, and more convenient to use. Figures 3, references 13: 10 Hungarian and 3 Western.

2542

CSO: 2502/42

ATTENUATION BY ATMOSPHERIC ABSORPTION AND ITS CONSIDERATION IN THE
DESIGNING OF MICROWAVE NETWORKS

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 9, 1981 pp 341-358

CSEBNOCH, JANOS, graduate physicist, scientific and engineering consultant, university lecturer, ORION Radio and Electrical Enterprise, Budapest

[Abstract] The following are the primary causes of fading caused by atmospheric factors: the physical and chemical parameters of the atmosphere (nitrogen, argon, carbon dioxide, and trace gases), atmospheric moisture (water vapor and droplets), and so forth. Theoretical expressions were derived for the characterization of the effects of these parameters alone and in combination. The application of the expressions in the designing of a star-patterned digital network was discussed. Such networks maintain communications among microwave terminals via a central microwave facility. In designing such networks, consideration must also be given to interferences caused by adjacent RF channels over the same RF channel, directional antenna characteristics, overreach interference, and interference resulting from external connections. An example illustrates the use of the theoretical considerations in a system consisting of transmitters, receivers, antennas, antenna wires, and miscellaneous accessories. Figures 14, references 10: 3 Western and 7 Hungarian.

2542

CSO: 2502/49

PROTECTION OF MICROWAVE RELAY EQUIPMENT FROM HIGH-FREQUENCY INTERFERENCE FIELDS

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 11, 1981 pp 428-431

MODER, ISTVAN, graduate electrical engineer, microwave development engineer, ORION Radio and Electrical Enterprise, Budapest

[Abstract] Electromagnetic interference is coupled to microwave relay equipment via galvanic connection, inductive connection, capacitive connection, and radiation connection. Methods for protecting microwave relay equipment from such interference include shielding, filtration, grounding, and circuit-engineering measures such as symmetrization, use of differential amplifiers, and use of interference-resistant coupling circuits or optoelectronic devices. The high-frequency interference fields represent a special problem. ORION has developed special equipment for the latter interference, which was tried in a 24-channel FM system. The equipment consists of a head frame (closed container on the roof or a special mast, connected to the antenna via a short cable. The container accommodates the RF, IF, and modulator units) and a ground frame, located near the control room (It is also a shielded construction, accommodating the baseband, service, remote-control, and testing equipment). The two parts are connected by a cable which may be 30-100 m long. The head frame contains one interference filter, and the ground frame contains two. The equipment is illustrated with wiring diagrams. While it is expensive, it performs satisfactorily. Figures 8, references 2: 1 Western and 1 German.

2542

CSO: 2502/51

ADVANCES IN POLISH SCIENTIFIC RESEARCH NOTED

New Nuclear Physics Agency

Warsaw RZECZPOSPOLITA in Polish 15 Jan 82 p 3

[Text] On 14 January 1982, the members of the Technical Progress Science Commission and the Legislative Work Commission, at a joint meeting under the chairmanship of Witold Zakrzewski, held discussions on a draft law on the formation of a State Nuclear Physics Agency. This is already the second presentation of this project by the government. Last year, the commission's discussions were suspended until the final version of the project was clarified. At this meeting, the text of its statute was adopted unanimously. The State Nuclear Physics Agency (PAA) will carry out the mission of a central organ of state administration in the field of nuclear physics. The area of PAA activity includes research and application from atomic physics in the national economy, the production of nuclear equipment and devices, radioactive materials and handling of same, radiological protection and nuclear safety along with the neutralization and storage of radioactive wastes. Among the matters under its jurisdiction are the licensing and control of the use of all nuclear facilities and devices within the scope of nuclear safety and also participation in the implementation of defense tasks, the issuance of clearances for key personnel employed in nuclear installations and supervision of the execution of assignments by its subordinate branch organization units.

Representatives of the Ministry of Mining and Power Industry; the Ministry of Science, Higher Education and Technology; the Ministry of National Defense; the Ministry of Health and Social Welfare; and the Ministry of Chemical and Light Industry took part in the deliberations. Jerzy Minczewski, Jan Kubit, Mieczyslaw Serwinski, Tadeusz Oriof, Lidia Jackiewicz-Kozanecka, Adam Lopatka and Jerzy Bukowski spoke during the discussions.

In the discussions they noted the important matters of environmental protection, negligence in the area of fuels and energy, the insufficient utilization of nuclear technology in agriculture for the production of phosphorus fertilizers, and the provision of basic pharmaceutical and health care supplies and medical equipment for health care establishments.

Jerzy Minczewski, representative of the minister of the government for nuclear physics, emphasized that since the beginning of industrial nuclear power engin-

eering in the world, the design, construction and operation of nuclear electric power plants and heating plants have been under the management of state economic-type ministries or industrial concerns. However, the supervision of the entire investment process and of operation is under the control of independent state organs of the type proposed in the Statute of the State Atomic Physics Agency.

Protein Production, Consumption Research

Warsaw RZECZPOSPOLITA in Polish 17 Jan 82 p 4

[Text] A recent subject of analysis was the implementation of the government research and development program "PR-4" ("Optimalization of the Production and Use of Protein"). The government program "PR-4" was the first on the list of seven programs in the Council of Ministers Resolution No 266/74 dated 16 November 1974. However, the coordination plan for "PR-4" was approved on 29 April 1977 by the Presidium of the Government (Decision No 48/77); the increase of the production of food and fodder protein was recognized as the main goal on the road toward maximum utilization of available protein sources and the creation of new sources.

The total actual outlays from 1976 to 1980 for the implementation of this government program amounted to over 2.3 billion zlotys. However, in the confirmed coordination plan, outlays of 2.9 billion zlotys were adopted for research and development. Simultaneously, 15.4 million zlotys in Western foreign exchange currencies was earmarked for this work, but only 2.5 million foreign-exchange zlotys of this amount was used.

As reported by the Institute of Animal Husbandry, the unit coordinating the first stage, the effect of the work carried out so far in the scope of the government program has been the development and production of 14 new varieties of grain and fodder crops, 8 new fodder and food industry products and 47 technological processes for producing fodder components, methods of storing fodder, agricultural engineering of fodder and food crops, the production of protein food products and new or improved marine fishing systems.

Also, 18 improved systems were found for feeding livestock, for fodder formulas and for proven nutritional standards. The result of the work within the scope of "PR-4" consists of 37 technological characteristics of new species of ocean fish and cephalopods from new fishing regions and 15 new or improved designs of equipment, cutters and ships.

The theses for the "PR-4" program (from 1975) anticipated the production of 200,000 tons of protein in 1980 as a result of the implementation of the research and development work. As shown by the analysis under the aegis of the Ministry of Science, Higher Education and Technology, whereas in the coordination plan for "PR-4" a total yield of 312,000 tons of protein was anticipated, in 1980 the results of the work made it possible to obtain 238,000 tons of fodder protein due to an increase in its production and efficient measures for its consumption. Thanks to this research, 40,000 tons of food protein was also obtained.

The second stage of implementation of the government program "PR-4" from 1981 to 1985 forecasts, among other things, a yield of 483,000 tons of fodder protein. In order to reach this goal, the earmarking of over 3 billion zlotys is anticipated for research and development.

The second stage of the large-scale research program "PR-4" ought to bring, among other things, 10 new varieties and 15 species of fodder plants, 26 agro-technical systems and regionalizing of fodder crop growing, 20 mix formulas and systems for feeding livestock and 15 technological processes for producing raw materials and fodder components. Also, new methods of conservation of grain seed and fodder crops, 16 genetic breeding problem solutions and 4 industrial methods for food products are expected to be found.

The research work within the framework of "PR-4" integrates the scientific developmental centers, the higher educational institutes of six ministries, and the institutes of the Polish Academy of Sciences.

Ultrasonic Microorganism Disintegrator

Warsaw RZECZPOSPOLITA in Polish 19 Jan 82 p 5

[Article: "Complicated Cell Research--Cooperation between the Polish Academy of Sciences and the USSR Academy of Sciences"]

[Text] During the current crisis, both economic and social, many agreements, links and contracts were disrupted. However, there are institutes and entire fields where such manifestations did not occur, or were rather limited in scope. Such is the case in numerous scientific centers, which, in spite of a lack of resources along with other difficulties, have been carrying out their research obligations in regard to foreign scientific partners.

Several years ago a program was initiated of multilateral cooperation between the academies of sciences of the socialist countries in the field of development and production of scientific research equipment and the automation of scientific research from 1970 to 1985. In this program, the areas of so-called specialization for individual academies were also defined. In the very framework of this program, the Experimental Plant of TECHPAN (Institute of Basic Technology Problems of the Polish Academy of Sciences in Warsaw) developed an ultrasonic microorganism disintegrator (type UDM--10), which, in conjunction with flow, thermostat and control systems developed in the Special Design Bureau for the Development of Biological Equipment of the USSR Academy of Sciences in Pushchino, forms a system that makes it possible to conduct unusually complicated internal cell research.

This system, the prototype of which will undergo operation research in 1982 at the research centers of the Polish Academy of Sciences and the USSR Academy of Sciences, makes possible a considerable expansion of the scope of biochemical, microbiological, molecular-biological and immunological research.

5808
CSO: 2602/14

END

**END OF
FICHE
DATE FILMED**

MARCH 22, 1982